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EXAMINER

YOUNG, NATASHA E

ART UNIT

PAPER NUMBER

1797

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |  |  |
|------------------------------|--------------------------------------|--|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/501,025 | <b>Applicant(s)</b><br>BRIDGWATER ET AL. |  |
|                              | <b>Examiner</b><br>NATASHA YOUNG     | <b>Art Unit</b><br>1797                  |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,6-10 and 13-15 is/are rejected.
- 7) ☒ Claim(s) 3,5,11 and 12 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 4, 6-9, and 13-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Green (US 6,830,597 B1).

Regarding claim 1, Green discloses an ablative thermolysis reactor comprising:

(i) a reaction vessel (3), (ii) an inlet into the reaction vessel for receiving feedstock (see figure 1), (iii) an outlet (50) from the reaction vessel for discharging thermolysis product, (iv) within the reaction vessel, an ablative surface (3) defining the periphery of a cylinder, (v) heating means (6) arranged to heat said ablative surface to an elevated temperature, and (vi) at least one rotatable surface (5), the, or each, rotatable surface having an axis of rotation coincident with the longitudinal axis of said cylinder, wherein the rotatable surface is positioned relative to the ablative surface such that feedstock is mechanically pressed between a part of the rotatable surface and said ablative surface and moved along the ablative surface by the rotatable surface, whereby to thermolyze said feedstock (see column 4, line 41 through column 6, line 41 and figure 1).

Regarding claim 2, Green discloses an ablative thermolysis reactor comprising: (i) a reaction vessel (3), (ii) an inlet into the reaction vessel for receiving feedstock (see figure 1), (iii) an outlet (50) from the reaction vessel for discharging thermolysis product, (iv) within the reaction vessel, an ablative surface (3) defining the periphery of a cylinder, (v) heating means (6) arranged to heat said ablative surface to an elevated temperature, and (vi) at least one rotatable surface (5), the, or each, rotatable surface having an axis of rotation coincident with the longitudinal axis of said cylinder, wherein the rotatable surface is positioned relative to the ablative surface such that feedstock is mechanically pressed between a part of the rotatable surface and said ablative surface and moved along the ablative surface by the rotatable surface, whereby to thermolyze said feedstock, and, wherein the reaction vessel is bounded by an inner wall with the ablative surface being defined by an outwardly facing surface of said inner wall (see column 4, line 41 through column 6, line 41 and figure 1).

Regarding claim 4, Green discloses a reactor wherein the reaction vessel is bounded by an outer peripheral wall with the ablative surface being defined by an inwardly facing surface of said outer wall (see column 4, line 41 through column 6, line 41 and figure 1).

Regarding claim 6, Green discloses a reactor wherein said ablative surface has a circular or elliptical cross-section perpendicular to the axis of rotation of the, or each, rotatable surface (see figure 1).

Regarding claim 7, Green discloses wherein said at least one rotatable surface (5) is in the form of a rotatable blade (see figure 1).

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Regarding claim 8, Green discloses a reactor wherein said heating means is adapted to heat said ablative surface to a temperature in the range of from about 400°C to about 700°C (see column 6, lines 20-41).

Regarding claim 9, Green et al discloses a reactor wherein said heating means is arranged to heat the ablative surface by electrical heating, by the combustion of a solid, liquid or gaseous fuel, by condensation of a vapour, or by circulation of a hot fluid (see column 4, line 41-67).

Regarding claim 13, Green discloses a reactor wherein the, or each, rotatable surface (5) is resiliently biased toward the ablative surface (see figure 1).

Regarding claim 14, Green discloses a reactor wherein a plurality of rotatable surfaces (5) are provided, the rotatable surfaces preferably being equi-angularly displaced about the axis of rotation (see figure 1).

Regarding claim 15, Green discloses a reactor wherein said reactor is provided with a continuous feed mechanism for supplying feedstock into said reaction vessel (see figure 1).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Green (US 6,830, 597 B1).

Regarding claim 10, Green does not disclose a reactor wherein means are provided to adjust the angle of the rotatable surface, or front surface of each blade when present, relative to the ablative surface.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have means that are provided to adjust the angle of the rotatable surface, or front surface of each blade when present, relative to the ablative surface,

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since it has been held that the provision of adjustability, where need, involves routine skill in the art (see MPEP 2144 (V-D)).

### ***Allowable Subject Matter***

Claims 3, 5, 11, and 12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 3, Green does not disclose a reactor wherein the, or each, rotatable surface is mounted outwardly of the ablative surface and arranged to press feedstock toward the axis of rotation (see column 5, lines 48-67 and figure 1).

Regarding claim 5, Green does not disclose a reactor wherein the, or each, rotatable surface is mounted inwardly of the ablative surface and arranged to press feedstock away from the axis of rotation.

Regarding claim 11, Green et al does not disclose a reactor wherein angle adjustment means are provided between each rotatable surface, or blade, when present.

Regarding claim 12, Green does not disclose a reactor wherein means are provided to adjust the spacing between each rotatable surface and the ablative surface.

### ***Response to Arguments***

Applicant's arguments filed April 22, 2009 have been fully considered but they are not persuasive.

The applicant argues that Green is not prior art.

The examiner disagrees, since Green was filed February 18, 2000 and is a U.S. patent which qualifies Green as a U.S.C 102(e) reference, since the filing date is two years prior to the date of filing of the PCT and the filing date is one year prior to the date of filing of the foreign priority document.

The applicant argues that Green does not disclose that the auger flight (5) of the auger (4) makes contact with the inner wall surface of the reactor tube.

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

Claim 1 reads that "the rotatable surface is positioned relative to the ablative surface such that the feedstock is mechanically pressed between a part of the rotatable surface and said ablative surface" (see lines 6-8), which the examiner does not interpret as the rotatable surface making contact with the wall surface of the reactor tube.

The applicant argues that Green discloses a taper tube and not a cylinder.

The examiner disagrees.

Disclosed in figures 1 and 3-5 and column 6, lines 20-41 are examples of the preferred shape tapered tube of the reactor tube and are for illustrative purposes only and should not limit the invention.

In addition, a tube is defined as any of various usually cylindrical structures or devices; a hollow elongated cylinder (see Merriam Webster's Collegiate Dictionary, 10<sup>th</sup> Edition).



The applicant argues that Green does not disclose that the feedstock is mechanically pressed between a part of the rotatable surface and said ablative surface.

The examiner disagrees.

The examiner believes that the rotating auger flight (5) while forcing the biomass into the reactor tube (2) is mechanically pressed against the reactor tube while the biomass is traveling down the reactor tube.

The examiner agrees that rotating auger flight does not accomplish this task in the same manner as the claimed invention.

Regarding claim 2, the applicant argues that Green does not disclose an outwardly-facing surface.

The examiner disagrees.

Since the auger flight (5) pushes the biomass into the reactor tube, the auger flight (5) must be helical and the blade must face outwardly.

Regarding claim 3, the applicant argues that Green does not disclose that the rotatable surface is mounted outwardly of the ablative surface, and arranged to press feedstock toward the axis.

Applicant's arguments, see Remarks, page 5, filed April 22, 2009, with respect to U.S.C. 102(e) rejection of claim 3 has been fully considered and are persuasive. The U.S.C. 102(e) rejection of claim 3 has been withdrawn.

Regarding claim 13, the applicant argues that Green does not disclose biasing the auger flight (5) toward the inner surface of the tube (2).

The examiner disagrees.

The examiner believes that the rotating auger flight (5) while forcing the biomass into the reactor tube (2) such that the auger flight (5) is biased toward the reactor tube.

The examiner agrees that rotating auger flight does not accomplish this task in the same manner as the claimed invention.

Regarding claim 10, the applicant argues that the limitation of the angle of the rotatable surface is adjustable is not merely a matter of "routine skill in the art".

The examiner disagrees.

The examiner believes that one of ordinary skill in the art could angle the auger flight (adjust the angle of the blade), which would result in the angle of the rotatable surface being adjustable.

The examiner agrees that rotating auger flight does not accomplish this task in the same manner as the claimed invention.

Regarding claim 12, the applicant argues there is simply nothing in the present record that would have prompted the skilled artisan to make the modification posited as routine skill.

Applicant's arguments, see Remarks, page 7, filed April 22, 2009, with respect to U.S.C. 103(a) rejection of claim 12 has been fully considered and are persuasive. The U.S.C. 103(a) rejection of claim 12 has been withdrawn.

Regarding claims 5 and 11, applicant argues that there is no motivation to combine and such a combination does not meet all the limitation of the claimed invention.

Applicant's arguments, see Remarks, page 7, filed April 22, 2009, with respect to U.S.C. 103(a) rejections of claims 5 and 11 have been fully considered and are persuasive. The U.S.C. 103(a) rejections of claims 5 and 11 have been withdrawn.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATASHA YOUNG whose telephone number is 571-270-3163. The examiner can normally be reached on Mon-Thurs 7:30 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/N. Y./

Examiner, Art Unit 1797

/Walter D. Griffin/

Supervisory Patent Examiner, Art Unit 1797